

THE MESOSTIGMATIC NASAL MITES OF BIRDS, III.  
NEW SPECIES OF RHINOECIUS FROM OWLS

(ACARINA, RHINONYSSIDAE)<sup>1,2</sup>

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Cooreman (Bull. Mus. Hist. Nat. Belgique 22: 1-4, 1946) was the first to describe a nasal mite from an owl, finding the specimens in the screech owl, *Asio otus*, in Belgium. The mite differed appreciably from all previously known forms, so he proposed a new genus, *Rhinoecius*, for its reception. The principal character of this genus is the one-armed chela. The three new species to be described below all have this characteristic, but they differ sufficiently in other particulars that Cooreman's original diagnosis needs to be modified.

Genus *Rhinoecius* Cooreman

Nasal mites of owls. Stigmas in normal position, between coxae III and IV, dorsolateral, and with short peritremes. *Chela of female with one arm only*; immovable arm lacking. Gnathosoma apical or nearly so. All tarsi with well developed claws and pulvillum. Podosomal shield present and well developed. Opisthosomal shield present or not; small accessory dorsal plates present or not. Genital and anal plates present and fairly distinct. Sternal plate very poorly developed or entirely lacking. Setae rather sparse and weak, best developed on tarsi. Telotarsus of each leg with a long, dorsal seta.

The above characterization is based on the females but, except for the usual sexual differences, may be applied also to the males.

*Rhinoecius grandis*, new species

Figs. 1-8, 26-28

A large nasal mite parasitizing the Great Horned Owl. It has one large and four small podosomal shields. The anal plate has three setae. The females average nearly one millimeter long.

*Female* (figs. 1, 2, 4, 26-28).—Average size of eleven specimens, 955  $\mu$ ; size varied from 815  $\mu$  to 1100  $\mu$ . Large dorsal plate uniform and averaged 391  $\mu$  long by 330  $\mu$  wide at widest point. *Dorsum*.—One large, fairly distinct dorsal shield covers approximately half of the podosoma. Under phase contrast microscope, this plate shows several clusters of small, clear circles, those of median anterior cluster about half the size of those of other clusters. A faint reticulation barely

<sup>1</sup>Parts I and II in Jour. Parasitol. 34: 505-514, and 37: 129-140 respectively.

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discernible over the rest of plate. Two rather prominent setae present on posterior margin, otherwise this plate devoid of setae. Four small platelets present, as shown in fig. 2. Nine pairs of small, indistinct setae and four pairs of pores are scattered over dorsum (this varies among specimens, and number may be slightly more or less than this). Stigmas dorsolateral, approximately between coxae III and IV, with short petriremes. *Venter*.—Three pairs of short sternal setae. A very faint sternal shield can be found in region of two anterior pairs of sternal setae. Genitoventral plate quite distinct, about twice as long as wide, broadly rounded posteriorly, faintly reticulate and with several clear spots in center. This plate flanked by a pair of pores or very tiny setae. Anal plate present, oval in outline and with a large cribrum, margin of anal plate not so distinct as figure indicates. It bears three setae, paired ones anterior to anal pore, odd one about midway between pore and cribrum. Venter otherwise has four pairs of tiny setae and a few small pores. *Gnathosoma* (fig. 27).—Terminology used here is the same as that proposed by Gorirossi (1950). *Basis capituli* has one pair of fairly prominent setae, were present on all specimens seen. Capitular groove and capitular teeth lacking. Beak generally has three pairs of setae; these extremely small, very difficult to find, and apparently lacking in some specimens. Palpal setae small and indistinct. Palp tarsus a small segment placed ventrally on the palp tibia; it has several setae including two rather long and distinct ones. Tectum an irregular membrane reaching nearly to middle of palp genu. The chelae one-armed, this single arm being about one-fifth length of chelicera. *Legs*.—Becoming progressively longer from anterior to posterior and averaging as follows: I, 572  $\mu$ ; II, 586  $\mu$ ; III, 614  $\mu$ ; IV, 722  $\mu$  long. Chaetotaxy as shown, the dorsal setae smaller than ventral, except on tarsi.

*Male* (figs. 3, 7, 8).—Average length of 4 specimens 860  $\mu$ ; range from 800  $\mu$  to 920  $\mu$ . Dorsal plate 330  $\mu$  long by 330  $\mu$  wide. *Legs*: I, 472  $\mu$ , II, 472  $\mu$ , III, 500  $\mu$ , and IV, 586  $\mu$  long. Chelicerae have a short immovable arm and a long movable arm to which is attached equally long spermatophore carrier. Sternal and genital plates combined as shown in fig. 7, but this very indistinct; genital pore quite evident. Sperm tube broadens posteriorly, as indicated by dotted lines in fig. 7. This structure visible in all males studied. Male otherwise exactly like female.

*Nymph* (figs. 5, 6).—Length 739-813  $\mu$ . No dorsal plate present, but several small, sclerotized areas may be picked out with difficulty. Nine to ten pairs of setae present in same relative positions as in female. On venter, only anal plate present, but it is much less distinct than shown. Same number of ventral setae present as in female.

*Larva*.—Two females contained larvae. They showed no unusual characters.

*Types*.—Holotype female and several paratypes, including male, female, and nymph are in the U. S. National Museum, Washington, D. C. The description was based on 18 females,

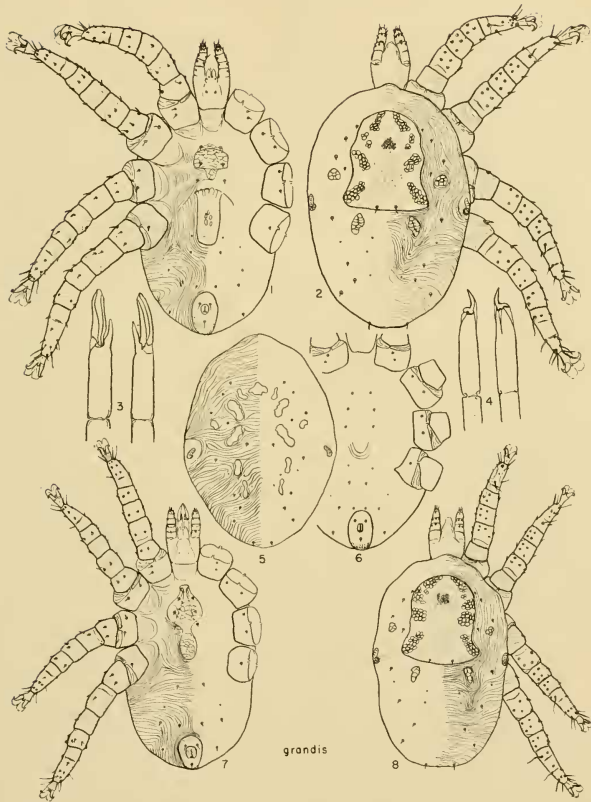


PLATE I. RHINOECIUS GRANDIS

Figs. 1 and 2, female; fig. 3, male chelicerae; fig. 4, female chelicerae; figs. 5 and 6, nymph; figs. 7 and 8, male.

5 males, and 9 nymphs. Specimens collected in Lubbock Co., Texas, December 13, 1950, John D. McLean.

*Type host*.—*Bubo virginianus* (Gmelin), the Great Horned Owl.

*Discussion*.—This mite is quite similar to the genotype, *Rhinoecius oti* Cooreman. It differs primarily in the shape and chaetotaxy of the dorsal plate. In *oti* this plate is broadly rounded and is devoid of setae, whereas in *grandis* it is bell-shaped and has two setae on the posterior margin. In his figure of *oti* Cooreman shows six setae on the anterior margin of the plate but in the text he says, "Il ne porte aucune pilosité."

It is true that the characters we have mentioned are variable in some Rhinonyssidae and that perhaps no real difference exists between these two mites, but I have seen a total of 18 females and five males and they all showed the same characteristics. This, plus the fact *grandis* is larger (*oti* is only 800  $\mu$  long) and comes from a different species of host, makes me confident that this is indeed a species distinct from *R. oti*.

The host owl was shot in a canyon near Lubbock, Texas on December 13, 1950. I examined it for mites the next day. Nearly all the mites were in the forward and drier portion of the nose and the nasal membranes were thickly speckled with what looked like fecal droppings from the mites. The mites were all well fed and the typical form of the digestive tract was clearly visible. The mites crawled actively and seemingly with better coordinated movements than most nasal mites; they all were still alive the next day. They were then placed in physiological saline and mounted in a chloral hydrate medium.

On December 25, 1950 I found a Great Horned Owl dead on the highway near Trinidad, Colorado. I examined the head two days later but found no mites.

#### *Rhinoecius cooremani*, new species

Figs. 9-16, 29-31

A rather elongated mite with a triangular podosomal shield and only two small platelets. Average length of the female about 760  $\mu$ .

*Female* (figs. 9-11, 29-31).—Five females were available for study. The length varied from 630  $\mu$  to 886  $\mu$ . The dorsal plate was uniform for all and measured 245  $\mu$  long by 214  $\mu$  wide at the widest point. *Dorsum*.—Podosomal shield fairly distinct, triangular, with several clusters of clear circles and faint reticulation, bearing 1 pair of small setae, medially located. Two small plates located in the midregion, posterior to podosomal shield. Ten pairs of very small setae and about six pairs of small pores present on soft portion of dorsum, arranged as shown.

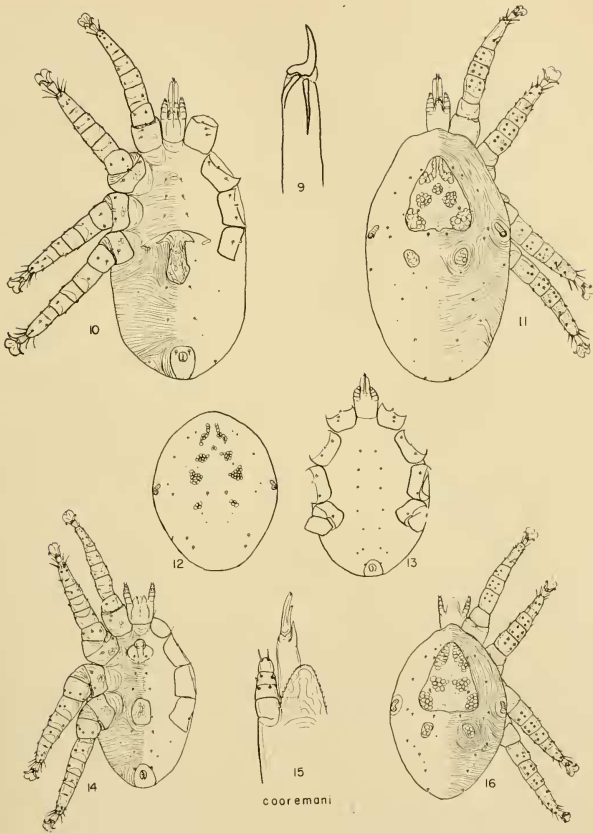


PLATE II. RHINOECIUS COOREMANI

Fig. 9, female chela; figs. 10 and 11, female; figs 12 and 13, nymph; fig. 14, male ventral; fig. 15, chela, tectum, and left palp of male; fig. 16, male dorsal.

*Venter*.—Sternal plate apparently lacking. Genital plate distinct, faintly reticulate, and with several clear spots on its center. Anal plate rather indistinct, pore near anterior margin; only two setae present, located anterior to pore. Well developed cribrum present which generally extends onto dorsal side. All ventral setae very small and slender. Three pairs of sternal setae and three pairs of opisthosomal setae, and several small pores arranged as shown. *Gnathosoma* (fig. 30).—The *basis capituli* devoid of setae. The beak with or without a pair of setae, these small and weak and extremely difficult to find. Other structures weak and difficult to see, but I believe them to be essentially as illustrated. Tectum a weak membrane extending as far as apex of the palpal genu. Ratio of chela to segment that bears it, 2:9. *Legs*.—Starting with longest one, order of length is IV, I, III, II. Length in microns: I, 443; II, 400; III, 440; IV, 472. As in the other species, setae weak, a little longer on ventral side and longest on tarsi.

*Male* (figs. 14, 15, 16).—Only one male was available, 570  $\mu$  long. Dorsal plate measures 229  $\mu$  long by 220  $\mu$  wide. Leg I, 370  $\mu$ ; II, 343  $\mu$ ; III, 360  $\mu$ ; IV, 400  $\mu$  long. Small sternal plate indicated. Genital plate present between coxae IV. Sperm duct can be traced back nearly as far as genital plate, but it does not widen posteriorly as does sperm duct of *grandis*. Chelae composed of a short, immovable arm and a longer, movable arm to which is attached a spermatophore carrier that extends well beyond the tip of the movable arm (fig. 15). Tectum a thin membrane with a finely serrated margin. Otherwise as in female.

*Nymph* (figs. 12, 13).—There were two specimens of nymphs, of equal size. Body length, 536  $\mu$ . Leg I, 330  $\mu$ ; II, 300  $\mu$ ; III, 307  $\mu$ ; IV, 330  $\mu$ . Dorsum with several clusters of clear circles but no plates. Venter shows only anal plate, that indistinctly. Chaetotaxy weak and arranged as shown.

*Larva*.—A larva was found within one female. It shows no unusual characters.

*Types*.—The holotype female and several paratypes, including the male and a nymph are in the U. S. National Museum, Washington, D. C. Specimens collected near Luling, Texas, March 22, 1951, Lamar Strandtmann.

*Type host*.—*Strix varia* Barton, the Barred Owl.

*Discussion*.—The triangular dorsal shield and the presence of only two small platelets distinguished this mite readily from others of the genus.

The host bird was collected early on the morning of March 22 and was not examined for mites until five days later. In the meantime the bird had been kept in an ice box two days and in a deep freeze box one night. Between times it had been in the car at about 70 degrees F. When examined on March 27 some of the mites were still alive.

This mite is named in honor of the Belgian Acarologist, Jean Cooreman.

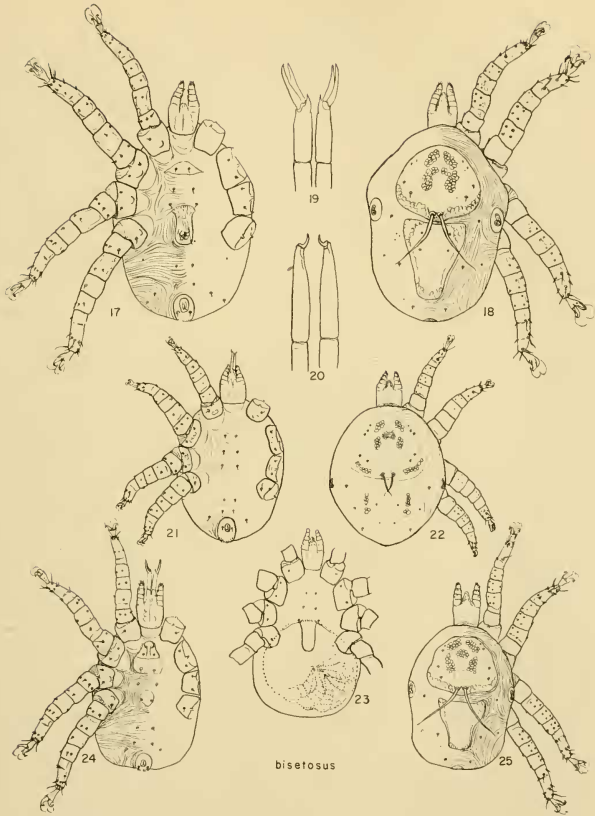


PLATE III. RHINOECIUS BISETOSUS

Figs. 17 and 18, female; fig. 19, male chelicerae; fig. 20, female chelicerae; figs. 21 and 22, nymph; fig. 23, female with larva, ventral view; figs. 24 and 25, male.

**Rhinoecius bisetosus**, new species

Figs. 17-25, 32-34

A short, broad mite inhabiting the nasal passages of the Burrowing Owl. It has two large dorsal shields and a pair of enormous, vertical setae arising from near the posterior margin of the anterior plate. Average length, 715  $\mu$ .

*Female* (figs. 17, 18, 20, 32, 33, 34).—Six specimens available for study, five of the same size, measuring 715  $\mu$  long; other shorter, only 630  $\mu$  long. Anterior dorsal plate 243  $\mu$  long by 315  $\mu$  wide; posterior plate 264  $\mu$  long by 230  $\mu$  wide. *Dorsum*.—Two large shields cover approximately half the dorsum, anterior one rounded at front and sides, posterior margin slightly convex, with a more prominent convexity medially, as shown. Plate lightly reticulate, with several clusters of clear circles and four pairs of very small setae in addition to a pair of enormous ones; anterior two pairs extremely small. Very long setae average 230  $\mu$  long and arise from a swollen area near posterior margin of plate; in life these setae stand erect, with tips bent backward. Posterior plate triangular with a broadly rounded apex; anterior margin slightly concave. Surface faintly reticulate, in some specimens it is possible to see one or two pairs of extremely small setae. Soft portion of dorsum has about four pairs of small setae and three or four pairs of small pores, all in opisthosomal region. *Venter*.—Three pairs of small, slender, sternal setae present. A faint suggestion of a sternal plate can be seen in region of first sternal setae. Genital plate distinct, reticulate and with a cluster of clear spots medially. Sometimes one or two setae found on posterior lateral margin. A pair of small pores present near plate. Anal plate fairly distinct, nearly terminal; cribrum extends onto dorsal side. Anal pore in anterior portion of plate. Only two setae present, located below middle of anal pore. All specimens showed four pairs of small setae and one pair of pores between anal and genital plates. *Gnathosoma* (fig. 33).—*Basis capituli* without setae or capitular groove (it is interesting to note, however, that one nymph did have an irregular row of capitular teeth). Beak with full complement of three pairs of setae, although they may be difficult to see. Tectum a simple, thin membranous structure reaching nearly to apex of palp genu. *Legs*.—Progressively longer from I to IV; leg I, 470  $\mu$ , II, 475  $\mu$ , III, 495  $\mu$ , V, 530  $\mu$ . All coxae show a slight ventral tuberosity. *Coxa I* apparently with only one seta. Otherwise chaetotaxy essentially like previously described species.

*Male* (figs. 19, 24, 25).—Only one male available, 543  $\mu$  long. Anterior dorsal plate measures 215  $\mu$  long by 257  $\mu$  wide, posterior plate 200  $\mu$  long by 171  $\mu$  wide. Legs I, II, and III 386  $\mu$  long, leg IV 414  $\mu$ . Long dorsal setae 171  $\mu$  long. A very faint shield surrounds genital pore and first pair of genital setae, and a non-striated region extends laterally and posteriorly to include second sternal setae. Otherwise as in female.

*Nymph* (figs. 21, 22).—Four nymphs available, three of these alike



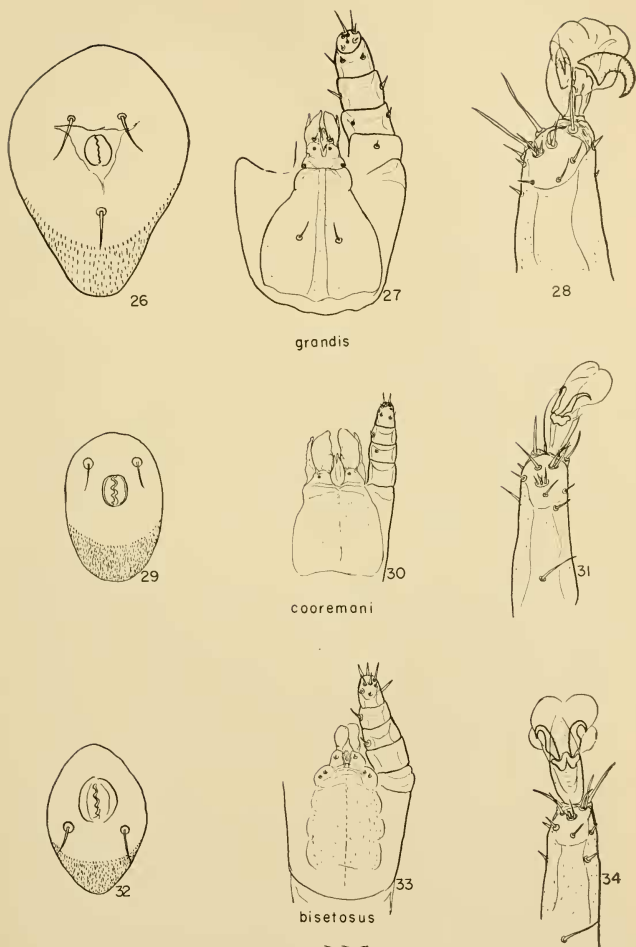


PLATE IV. STRUCTURES OF RHINOECIUS

Figs. 26, 27, 28, anal plate, gnathosoma, and tarsus I respectively of *Rhinococcus grandis*; figs. 29, 30, 31, anal plate, gnathosoma, and tarsus I of *Rhinococcus cooremani*; figs. 32, 33, 34, anal plate, gnathosoma, and tarsus I of *Rhinococcus bisetosus*.

in size, measuring 490  $\mu$  long. Legs I to IV respectively 280, 300, 300, and 300  $\mu$  long. Long dorsal setae 100  $\mu$  long. Fourth nymph larger, measuring 515  $\mu$  long, legs of this mite 315, 315, 330, and 345  $\mu$  long. Only anal plate visible, dorsum shows characteristic clusters of clear circles.

*Larva* (fig. 23).—One female mite contained a hexapod larva. It shows nothing unusual. I could find two points of attachment for large setae, but the setae themselves not yet developed. The figure indicates the relative size of the larva and mother.

*Types*.—The holotype female and several paratypes, including the male and nymph are in the U. S. National Museum, Washington. Specimens collected Dec. 30, 1950, Lubbock Co.

*Type host*.—*Speotyto cunicularia* (Bonaparte), the Burrowing Owl.

*Discussion*.—Several hours after the host was collected it was placed in a jar and a chloroform-moistened pad added to kill the Mallophaga. The bird was dead before placed in the jar and it was left about ten minutes. When the head was opened later some of the nasal mites were still alive.

The two enormous setae on the center of the dorsum distinguish this mite at once from all other nasal mites. In life these setae are erect. What function they might serve I do not know. Apparently the mite causes no great discomfort as the host bird was in excellent condition, very fat.

#### SUMMARY

Three new species of nasal mites from Strigiforme birds are described. They are *Rhinoecius grandis* from the Great Horned Owl, *Rhinoecius cooremani* from the Barred Owl, and *Rhinoecius bisetosus* from the Burrowing Owl. The male, female and nymph of each species is described and figured.

#### ENTOMOLOGICAL SOCIETY OF WASHINGTON

##### 617TH REGULAR MEETING, THURSDAY, APRIL 3, 1952

The 617th regular meeting of the Society was called to order at 8 P.M. by President W. D. Reed on Thursday, April 3, 1952, in Room 43 of the U. S. National Museum. Forty-seven members and 19 visitors attended. The minutes of the previous meeting were read and approved.

New members elected were:

Rufus H. Vincent, Office of the Chief of Engineers, Department of the Army, Washington 25, D. C.

Lt. B. G. Hightower, 315 Claremont, San Antonio, Texas.

Dr. Joseph H. Camin, Entomology-Zoology Department, South Dakota State College of Agriculture and Mechanic Arts, Brookings, South Dakota.